

REMARKS

Claims 1-6, 9-19, 21-25, and 27-28 are pending in the application. Claims 1-6, 9-19, 21-25, and 27-28 stand rejected under 35 USC §103(a). A Notice of Appeal was filed on September 17, 2001. The foregoing amendments are believed to place the claims in position for allowance for the reasons discussed below.

Claims 1- 28 -- 35 U.S.C. § 103

The rejection to claims 1-6, 9-19, 21-25, and 27-28 as obvious under 35 USC § 103 over Wang (U.S. Patent No. 5,334,976) in view of Herzog et al (U.S. Patent No. 4,669,903). and Klauber (U.S. Patent No. 5,143,462) is respectfully traversed.

In order to expedite their allowance, Applicant has amended claims 1 and 23 to recite that the keys have a width of 7.2 to 13 millimeters and a depth of 7.2 to 15 millimeters. Support for this amendment may be found on page 9 lines 14-15 in the Specification, and in original claims 7 and 8. Applicant has further amended claim 23 to recite that the key spacing claimed is directed at the keys corresponding to the letters of the English alphabet. Support for this amendment may be found in the existing claim 23 and in the Specification on page 9.

In contrast to the presently claimed input apparatus, the keyboard disclosed in Wang is a stylus actuated keyboard, therefore the dimensions of the keys are different than those for a finger actuated keyboard. Wang fails to appreciate the need for the presently claimed combinations of smaller than normal dimensions on a solely finger actuated keyboard. As a result the average user of the Wang keyboard would be uncomfortable touch typing on the presently claimed invention due to the small dimensions.

The discrepancies between the two inventions arise from the goals each invention is directed toward. Wang discloses a stylus actuated keyboard which can be mounted at an angle or used with a graphical tablet (col 6, lines 8-10). Both aspects aimed at creating a smaller overall footprint on the desktop. (col 6, lines 9-10)

The present invention is directed toward a finger actuated keyboard designed to accommodate the needs of children and adult users with smaller than normal hands. The smaller overall footprint in the present invention is a result of fitting the key spacing and keypad area to the size of the users hands. In Wang, the converse is true. The smaller key spacing and keypad area are a result of an attempt to create a keyboard with a smaller footprint. Furthermore, to achieve this smaller footprint, Wang has eliminated the single most important design criterion of the presently claimed invention, namely, the users fingers.

Another important design criterion overlooked in Wang is the keystroke travel range. The presently claimed keyboard includes a keystroke travel range to accommodate users with smaller than average hands. In contrast, Wang teaches the advantages of a membrane style keyboard, thus keystroke travel range is irrelevant. Conventional keystroke travel ranges contemplate the needs of the average adult typist. The non-obvious choice of a modified keystroke travel range in the present invention is responsive to the specific physical characteristics of children and adults with smaller hands. This need has not been addressed in nor made obvious in light of the prior art.

Neither the Herzog et al. patent nor the Klauber patent make up for the deficiencies of the Wang reference. Herzog et al. discloses a keyboard which results in the operator obtaining a proper bio-mechanical alignment from the elbow to the fingertips. Herzog et al. teaches a relative offset of each row of keys, but does not disclose or suggest the presently claimed center-

to-center spacing, key width and depth requirements, or keystroke travel range. Further, Herzog et al. does not include any disclosure relating to the ergonomic problems faced by children or small-handed adults using keyboards.

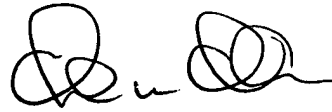
Klauber relates to a keyboard for more effective backspacing and erasing mistakes without averting the eyes from the copy. Klauber teaches the placement of a backspace/erase key within the reach of a thumb. Klauber does not disclose or suggest the presently claimed center-to-center spacing, key width and depth requirements, or keystroke travel range. Klauber also fails to appreciate or suggest the ergonomic problems faced by children or small-handed adults using keyboards.

Accordingly, claims 1-6, 9-19, 21-25 and 27-28 are clearly not obvious over the Wang patent in view of Herzog et al. and Klauber. Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 1-28 under 35 U.S.C. § 103.

Conclusion

In view of the forgoing amendments and remarks, each of the claims remaining in the application is in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections. The Examiner is invited to contact the undersigned at (336) 607-7315 to discuss any matter relating to the present application.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Amendments in the Claims:

In accordance with 37 CFR 1.121(b), the following claims show all the changes made by the foregoing amendments relative to the previous versions of the claims (additions underlined; deletions [bracketed]).

Claims 1 and 23 are amended as follows:

Claim 1. (Thrice amended) A fixed key input apparatus comprising a plurality of keys to generate input signals corresponding to each letter of an alphabet wherein the keys are arranged with a horizontal key spacing, centerline to centerline, of 10.8 to 16.4 millimeters, a vertical key spacing, centerline to centerline, of 10.8 to 18.0 millimeters, an individual key width of 7.2 to 13 millimeters, an individual key depth of 7.2 to 15 millimeters, and the keystroke travel range of said keys is about 0.9 to 6 millimeters.

Claim 23. (Twice amended) An ergonomic input apparatus comprising a plurality of keys, said plurality:

generating input signals corresponding to each letter of the English alphabet;

generating input signals corresponding to each arabic numeral 0 to 9;

generating input signals corresponding to a function to be undertaken wherein said function comprises: shift, return, control, alt, tab, caps lock, home, end, page up, page down, clear, scroll lock, up, down, left, right, backspace, delete, number lock (num lock), enter, print

screen, scroll lock, pause, escape (esc), option, or combinations thereof; and generating input signals corresponding to symbols wherein said symbols comprise: ` , ~ , ! , @ , # , \$, % , ^ , & , * , (,) , _ , - , + , = , \ , | , } , { , [, : , ; , " , ' , , < , > , . , ? , or /;

wherein said [plurality of] keys generating input signals corresponding to each letter of the English alphabet are [is] arranged in an array having a horizontal key spacing, centerline to centerline, between adjacent keys, of 10.8 to 16.4 millimeters, a vertical key spacing, centerline to centerline, between adjacent keys of 10.8 to 18.0 millimeters, an individual key width of 7.2 to 13 millimeters, an individual key depth of 7.2 to 15 millimeters and

wherein the keystroke travel range of said keys is about 0.9 to 6 millimeters.